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December 2, 2015

**\*\*\*Via E-Mail and Regular Mail\*\*\***

L. Alexandra Liverman  
Oregon Department of Environmental Quality  
Northwest Region Cleanup Program  
700 NE Multnomah St, Suite 600  
Portland, OR 97232

**Subject: Response to Comments, Schnitzer ASD Yard Riverbank Feasibility Study  
Gunderson LLC Portland Facility  
Portland, Oregon, ECSI#1155**

Dear Alexandra,

The "This letter presents responses to comments on the September 30, 2014 Schnitzer ASD Yard Riverbank Feasibility Study (FS), prepared by Apex Companies, LLC (Apex) on behalf of Gunderson LLC. The agency comments were issued by the Oregon Department of Environmental Quality (DEQ) on February 10, 2015. The DEQ comment letter included comments from CDM Smith, a United States Environmental Protection Agency (EPA) contractor, and Hydro Analysis, contractor for the Five Tribes.

Attached are the agency comments presented in italics, followed by our responses.

If you have any questions or comments, please call me at (503) 598-3805.

Sincerely,



Soren Hill for

David Harvey  
Environmental Director

Enclosure: Response to Comments Letter from Apex to Gunderson

Copy: Dan Hafley, via e-mail only  
Max M. Miller, Jr., via e-mail only  
Chris Breemer, via e-mail only  
Herb Clough, via e-mail only



October 21, 2015

David Harvey  
Gunderson LLC  
4350 NW Front Avenue  
Portland, OR 97210

Re: Response to Comments  
Schnitzer ASD Yard Riverbank Feasibility Study  
Gunderson LLC  
ECSI# 1155

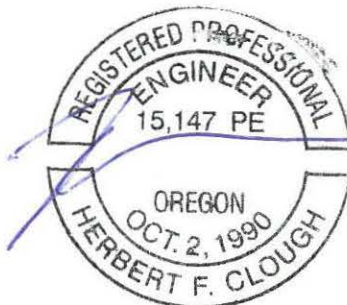
Dear Mr. Harvey:

This letter presents responses to comments that were issued by the Oregon Department of Environmental Quality (DEQ) on February 10, 2015 for the September 30, 2014 Schnitzer ASD Yard Riverbank Feasibility Study (FS), which was prepared by Apex Companies, LLC (Apex) on behalf of Gunderson LLC. The DEQ comment letter included comments from CDM Smith, a United States Environmental Protection Agency (EPA) contractor, and Hydro Analysis, contractor for the Five Tribes. Agency comments are presented in italics, followed by responses.

Please contact me if you have any questions.

Sincerely,

APEX COMPANIES, LLC



EXPIRES: DEC. 31, 2015

Herb Clough, P.E.  
Principal

## DEQ Comments

### General Comments

*1. Hot Spots. The recommended site remedy does not include hot spot removal. Given the high concentrations of contaminants detected in the Area 3 riverbank, their availability, and DEQ's preference for treatment of hot spots, we expect that the final bankline remedy will include a hot spot removal component. Acknowledging that hot spots are widespread, the FS should include a tiered analysis of (upland) hot spot removal under Alternative 3, ranging from removal of hot spots with the highest exceedance quotients, to removal of all riverbank hot spots. Based on the nature of this FS, potential remedy, and that the riverbank is adjacent to an in-water sediment management unit, in-water ecological hot spots do not need to be considered. However, human health hot spots and terrestrial hot spot values do apply, and must be evaluated as part of the final FS report.*

The FS included evaluation of hot spots. Screening for hot spots was included in multiple sub-sections of Section 3, and these sub-sections have been updated per DEQ's revised protocols for evaluating riverbank soil. The evaluation has been expanded in Section 6 and a new appendix in the revised FS. The recommended bank remedy includes necessary removal of hot spots.

*2. Capping Versus Rock Buttressing. While elevated contaminants are present in bankline soil below both the Gantry and Stevedore areas, the proposed remedy is limited to placement of rock to achieve a 1:1 slope. It is not clear that this remedy is as effective as actually capping the contamination and armoring the soil cap to achieve a minimum 2:1 slope.*

See response to General Comment on Rock Buttressing below. That response and the corresponding revisions to the FS clarify that the rock buttress also serves as a cap that is effective at maintaining stability, preventing erosion, and preventing direct contact with soil.

*3. Remedial Action Objectives. Source control objectives are presented in Section 5.1. RAOs are referenced in the Draft FS (Section 8.4), but project RAOs are not defined in this portion of the Draft FS. It is assumed they are the same for this Draft FS, but this should be clarified.*

The RAO term was mistakenly used in place of source control objective. Sections 8.2, 8.3, and 8.4 were revised to clarify that source control measures are addressing source control objectives, not RAOs.

*4. Post-Remedy Bankline Slope Stability. There is a basic discussion of the materials that comprise the riverbank in Area 3, generally described as dredge sands. This material has been ascribed a friction angle of 27 degrees, and with a 1.5 factor of safety added, it is concluded that a safe slope is 3 (horizontal) to 1 (vertical), or 3: 1 (Section 4.5). Across several of the evaluated remedial options, it is implied that a layer of rock is sufficient to add to a 1.5: 1 slope to maintain the same level of stability of a 3: 1 slope. Further, areas under the existing Gantry and below the Stevedore Building are proposed to have only rock placed at a 1: 1 slope, with little to no additional discussion. Additionally, there are no areas identified in text or figures as to which areas would be graded to 1.5: 1 vs. the 3: 1 grade. This is further confused based on some of the Figure cross-sections (see General Comment, below). As these slopes are common through three of the evaluated remedial options, additional discussion is warranted (see specific comments below).*

Section 4.5 was expanded to make the following clarifications.

- There is insufficient data available to make final decisions on finish slopes at the FS stage. Therefore, the FS evaluates a range of slopes to assure that the selected remedy will accommodate the finish slope that will be selected in final design.
- Several factors are considered in evaluating potential finish slopes and include upland operations, bank stability, in-water remedy, and habitat considerations.
- Upland operations are discussed in an expanded Section 4.4 and referenced in Section 4.5.
- The FS evaluated a range of slopes that covers the likely range of soil strength conditions that may be encountered. This range in slope corresponds to conditions using existing soil and conditions assuming imported sand and gravel fill.
- The in-water remedy is discussed in a revised Section 4.6 and referenced in Section 4.5.
- Habitat considerations are discussed with expanded Sections 4.3 and 4.5.

References to Section 4.5 were added to applicable sub-sections in Section 8. Some of the cross-sections on Figures 6 and 10 were mislabeled and that has been corrected. The figures were modified to clarify that a range of slopes were evaluated in the FS.

*5. Berm Construction. In various scenarios of riverbank slope adjustment, including the recommended remedy, soil excavated from the upper portion of the riverbank would be placed at the top of the bank. In general, DEQ is uncomfortable with the concept of using bankline soil to construct a riverbank berm. If excavated bankline soil exceeds hot spot values, it should be transported off-site for landfill disposal. If contaminant concentrations in excavated material are below appropriate screening values for, we are willing to consider capping of the material on-site away from the riverbank, but recommend off-site disposal for human health hot spots. Berm construction is further complicated if the City of Portland considers this area to be in a greenway setback zone, where any buried material would need to be placed at least 50 feet from the top of bank.*

The FS evaluates a range of alternatives that includes both capping and removal alternatives. To aid in evaluating alternatives and the efficacy of hot spot removal, it is appropriate to include an alternative that caps the material essentially in place and does not include hot spot removal. In reality, the most logical in-place capping alternative would include balanced cut and fill along the riverbank. However, it was concluded that it would be inappropriate to grade contaminated material from above mean high water to below mean high water. The options were to use imported fill outward into the river to create acceptable slopes or to grade material upward to decrease fill in the river. The FS included the latter. DEQ's proposed alternatives (off-site disposal or on-site disposal away from the river) are different alternatives, not just variations on the capping alternative. The term "excavated" used on the cross-section was misleading. These soils are not actually excavated but would be re-graded to create a stable slope (together with imported fill). On-site landfilling (away from the river) was not considered feasible because of the loss of useable land area. Gunderson already has a Greenway conformance plan agreed to by the City of Portland that will be implemented post-remedy; the proposed solution is consistent with the conformance plan. Further, the remediation remedy takes precedence over the Greenway code in relation to the remedy selection process and Gunderson is subsequently only required to implement the remedy consistent with the Greenway code. The combination of the relatively low berm and native plants proposed in the alternative are consistent with these goals. In fact, the berm would better shield the upland industrial activity from sight lines originating on the river.

*6. Figures. In several of the remedial action plan figures, cross sections are indicated with A-A', B-B', and so on. These labeled transects do not appear to correspond with indicated cross sections on subsequent examples. For example, D-D' on Figure 5 runs through the rock buttress slope at the Gantry. On Figure 6 however, cross section D shows the 3:1 slope. Please clarify and correct the Figures.*

The cross-section figure labeling has been corrected on Figures 6, 7, and 10.

*7. Remedies in relation to in-water work. There is minimal discussion about the evaluated riverbank remedies being implemented in conjunction with the in-water remedial actions as part of future Portland Harbor Record of Decision. In the Portland Harbor FS, it is DEQs understanding that the EPA's draft "technology assignment" in the vicinity of Area 3 is dredging. The final FS report should better discuss/evaluate how the proposed riverbank caps would be integrated with the potential for adjacent dredging in each of the evaluated options.*

Section 4.6 summarized the understanding of the proposed in-water remedy and the cross-section figures (Figures 6 and 10) showed how the bank measure would be coordinated with the in-water remedy. However, since production of the draft riverbank FS, the EPA has published an updated draft FS for the in-water remedy. Section 4.6 has been revised to identify the proposed in-water remedy in the updated draft FS. The proposed in-water remedy adjacent to the riverbank is capping beneath structures and dredging elsewhere. For habitat considerations in nearshore areas, the finish surface would be restored to match existing elevation (i.e., after dredging, fill would be placed to the original elevation). The cross-section figures in the riverbank FS have been updated to show the coordination between the riverbank alternatives and the in-water remedy.

*8. Rock Buttrressing. There is minimal discussion as to why rock buttrressing to a 1: 1 slope beneath the Stevedore Building and Gantry would be protective, beyond brief mentions in two of the remedial alternatives evaluations, given that contaminant concentrations in these areas exceed hot spot levels. These areas would need to be as protective as the rest of the riverbank remedy, but there is no discussion as to why this would provide long term protectiveness and stability in these two areas.*

Section 5.0 identified the objectives of the source control measure to be prevention of migration of soil to the river and prevention of direct contact by human and terrestrial receptors. Coarse rock is a well-established mechanism to address surface erosion. The rock fill will buttress the slope to protect against slope failure. Section 4.5 was expanded to provide additional information on stability of proposed slopes, and references to Section 4.5 were added to applicable sub-sections in Section 8. For each of the capping alternatives (Sections 8.2 and 8.3), the first bullet in each section describes the construction of the cap and indicates a minimum thickness of 2 feet (3 feet where rock is used). Two to three feet of soil (especially rock) is well-established as protective at preventing direct contact, regardless of the presence or absence of hot spots. For the removal alternative, except beneath the Stevedore Building, hot spots are removed. The rock buttress serves as fill to restore grade, as a stability mechanism, and to prevent erosion. The cross sections on Figures 6 and 10 were revised to clarify that a filter layer (including filter fabric) would be installed between native soil and the rock buttress. The combination of rock, filter layer, and filter fabric create a cap that is effective at preventing both direct contact and migration of riverbank soil to the river.

*9. Asbestos Containing Materials. Prior to the implementation of any of the potential remedies, the large volumes of asbestos containing materials (ACMs) present under plastic sheeting beneath the Gantry will need to be removed and disposed of following appropriate asbestos rules. While Gunderson employed an asbestos contractor to clear soil samples during riverbank surface soil sampling, samples will need to be collected and submitted to laboratory analysis of asbestos before any earth work on the riverbank can be completed. This may impact total cost estimates of some remedial alternatives.*

A new Section 2.7 was added to the FS explaining the presence of the suspect asbestos containing material and that the material will be evaluated and removed prior to implementation of a riverbank source control remedy. Therefore, asbestos containing materials are not evaluated as part of the FS.

*10. Selected Remedy and Permitting. Depending on the selected remedy, Gunderson is proposing upwards of 9,000 to 12,000 cubic yards (or more) of fill to be placed within the 100-year floodplain. It is unclear whether applicable permitting agencies (Corps of Engineers, NMFS, City of Portland, etc) will allow this volume of fill to be placed, or*

*whether there would be other concerns or costs associated with this work. Some changes may need to be considered after an appropriate remedy is selected when the measure is in final design prior to implementation.*

While balanced cut and fill is part of the City of Portland Development Code, Superfund remedies and removals are only required to meet the substantive requirements of applicable or relevant and appropriate provisions of other state and federal laws (ARARs). This requirement does not apply to local laws, such as the City of Portland Development Code. However, the substantive provisions of local laws are "to be considered." EPA will not opine about the applicability of the City of Portland cut and fill code until the ROD. It is understood that there will be a number of issues that would be resolved during final design. The FS attempts to account for those items that might influence remedy selection. In the event that the City of Portland cut and fill code is determined to apply or is considered a substantive requirement, the dredge volumes for the final in-water remedy (as defined in the draft Portland Harbor FS) greatly exceed the volume of fill needed for bank work and in-water caps. Section 4.6 was expanded to add discussion regarding in-water cuts/fills from the EPA draft FS. Discussion was added to Sections 8.2 through 8.4 that clarifies the off-set between dredge and fill volumes.

*11. Tables 2 through 4. Construction contingency costs are included as a line item, but are set to 0%, which appears to be a mistake.*

It is understood that FS guidance includes consideration of scope and bid contingencies for FS cost estimates. In this case, the technologies being used in the various alternatives are similar. Additionally, this action is a bank source control measure, and the limits of excavation are not defined by COC concentrations. Therefore, the contingency percentage would be approximately the same for each alternative, so the contingency would not change the ranking of the alternative costs. Given that application of a contingency in this case does not impact remedy selection, Gunderson has elected to not include a contingency in the cost estimates.

*12. Figures. The datum for referenced elevations should be noted.*

The datum (NAVD88) was added to the figures.

*13. Appendix D. All of the figures in Appendix D appear to have not included GP-316, a location that had elevated concentrations of COPCs. This location should be added and evaluated.*

As described in Section 3.2, soil data collected within 100 feet of top of the riverbank was evaluated for potential impact on river sediments. GP-316 was located 140 feet from the top of bank so is not included in the data set evaluated.

*14. Appendix F. Table 3.4-1 from the Lower Willamette Group's (LWG's) draft FS report for Portland Harbor was provided to support the lack of consideration of the Oregon DEQ Hot Spots in the FS Report remedial alternative comparisons. As the riverbank in Area 3 is an upland site, adjacent to the Portland Harbor site, this citation/reference is not applicable, as they apply for terrestrial receptors and human health receptors.*

Consistent with the JSCS guidance, the FS prepared to evaluate source control measures is a streamlined FS. In that spirit, where appropriate, conclusions from the Portland Harbor FS were used in preparing this FS. One such area where efforts were streamlined was in selecting ARARs, and the Portland Harbor ARARs were reproduced in Appendix F. Recognizing that Table 3.4-1 from the Portland Harbor FS was relatively dated, we reviewed the table for potential changes. One change identified was EPA's consideration of the Oregon hot spot rule for in-water use. Section 5.2.4 noted that potential change in Table 3.4-1. Given that hot spots were evaluated and considered throughout the FS, Appendix F was not provided to support lack of consideration of hot spots. Section 5.2.4 was revised to reduce confusion.

## Specific Comments

**Section 2.1.** *The top of bank is defined as 31 feet NAVD88, ordinary high water at 20.2 feet NAVD88, and the in-water portion of Portland Harbor as below or equal to 13 feet NAVD88 (equating to mean high water). Please include a table in the report identifying these elevations in relation to both NAVD88 and City of Portland datum, ordinary high water (OHW), and mean high water (MHW). We acknowledge that in-water action is necessary under EPA, and is the reason for integration of the upland SCM with the in-water remedy.*

A summary table was inserted in the text of Section 2.1.

**Section 2.3.** *There is brief reference to manmade materials in the riverbank including metals. More substantive discussion is warranted regarding the extensive amount of metal debris present in and below the riverbank in the southern portion of ASD Yard area. Based on analytical results, there appears to be an association between metal debris and elevated concentrations of metals, PCBs, and dioxins. Some large metal debris (portion of a ship hull, for example), may pose an impediment to remedy implementation and should be discussed in terms of SCM remedy implementation.*

A detailed reconnaissance of the riverbank was conducted as part of the source control evaluation, and debris was described in detail in that report, including nearly three pages of text and 16 photographs. The text of Section 2.3 has been revised to more explicitly reference these descriptions of riverbank soil, armoring, and debris. Sections 8.2, 8.3, and 8.4 were expanded to reference the presence of the debris. Costs for excavating and recycling/disposing of debris were already included in the estimates.

**Section 2.5.** *Please discuss how storm water outlets will be maintained/rebuilt during construction, and the costs should be reflected in the remedy cost estimates.*

The stormwater outfalls were added to Figure 3 and referenced in Section 2.5. Text was added to each of Sections 8.2, 8.3, and 8.4 indicating that the outfalls would need to be adjusted to the location of the final bank. Costs for adjusting the outfalls were added to the estimates.

**Section 2.7.** *The statement that there are areas of the bank that are steeper than the "average slope" is qualitative and vague, and does not capture the extent to which portions of the ASD Yard are oversteepened and subject to erosion and mass wasting prior to implementation of riverbank stabilization measures. Based on the above conclusion, half of the riverbank is steeper than the "average slope" by definition, but there is no indication that the average slope is stable, what the average slope for the riverbank may be, nor why the average slope is of importance as a measure. Based on subsequent sections, the materials that make up the bank are dredge sands which would require a 3:1 slope (including a 1.5 factor of safety) for long term stability. Based on that definition, it is not clear that any slopes on the Gunderson riverbank are stable long-term. A more thorough geotechnical discussion of the current condition of the slopes is warranted, and will likely help focus the discussions on the slope options in the SCM remedial alternatives evaluation.*

A detailed geotechnical evaluation of the riverbank was conducted as part of the source control evaluation, and that report details the results, including nearly four pages of text, nine surveyed cross-section, and 16 photographs. That report was submitted to DEQ and repeating that information is not warranted. Section 2.7 clearly states that portions of the bank "could fail if left unprotected." Additional discussion of bank stability was added to Section 4.5. That information is sufficient for evaluating source control alternatives. It is understood that further geotechnical evaluation will be needed for design.

**Section 4.3.** *Extensive work has been completed as part of the riverbank interim SCMs (ISCMs) in Area 3 and should be described. It is unknown if or how the existing ISCMs will affect final SCM cost or implementation (if any), and should also be discussed.*

Section 4.3 was expanded to describe the ISCMs. The ISCMs are focused on preventing erosion until implementation of the final source control measures and in-water remedy. They do not address the overall bank stability, so the ISCMs are not expected to substantively affect selection, cost, or implementation of final source control measures.

***Section 4.5.** This section discusses the general riverbank stability based on soils present (dredge sand), with an internal friction angle of approximately 27 degrees, or a slope of 1.5: 1. With a factor of safety of 1.5, the optimum slope for long-term stability is 3:1. While these values are generally within the range of estimated values for dredge sand fill (sand to silty sand), the section continues to state that "using a sand/gravel fill with an armored slope could result in an acceptable slope of 1.5: 1." It is unclear, after the extensive soil sampling and borings on and at the top of the riverbank, where these areas of sandy gravel might be located. If the conclusion is that the riverbank is primarily dredge sand, it is also unclear why this second material type (and therefore slope) is discussed as an option. It is also unclear whether, if encountered, a 1.5: 1 slope includes a factor of safety, or if in order to achieve long term stability, whether additional rock buttressing would be required to achieve long term stability. Additional discussion is warranted. An optimal slope for the riverbank following remedy is at least 3: 1.*

Section 4.5 was expanded to clarify that sand/gravel is referring to new, imported fill placed in front of the existing bank. Again, the FS evaluated a range of potential finished slopes to verify that the finished slope does not have a substantive bearing on the selection of the final measure. The actual slope will be determined during design.

***Section 5.2.3.** This section states that Hot Spots were evaluated based on Oregon Administrative Rules (OAR 340-122085 (5, 6, 7) and 090 (4)), but further states that because hot spots are not being considered for river sediments, as they are only applicable for direct contact to soil. While the Oregon Hot Spot rules are not considered an ARAR for the draft in-water Portland Harbor feasibility study, they are certainly applicable at upland sites adjacent to Portland Harbor. As such, the treatment of hot spots needs to be more thoroughly considered and discussed (see also our first general comment above). Refer to Appendix a (Section A.1.3) of the JSCS for more information.*

The final sentence in Section 5.2.3 is incorrect and was in that section in error. Hot spots were considered for both upland and in-water pathways as discussed in Sections 3.1, 3.5, 3.6, 4.2, 5.1, 5.2.3, 8.1 through 8.4, 9.8, and 10.1. In addition, the hot spot evaluation was revised in accordance with DEQ's revised protocols for evaluating riverbank soil.

***Section 5.2.4.** This section states the assumption that the ARARs used in the FS Report would be the same as the Draft FS for Portland Harbor, and that the Oregon Hot Spot Rule is not applicable. This assumption is incorrect, as the Oregon Hot Spot Rule does apply to upland human health receptors and terrestrial ecological receptors. The Oregon Hot Spot Rule needs to be considered in the final FS report for these scenarios.*

Hot spots were considered in the FS. See response to General Comment on Appendix F.

***Section 7.2.** The bullet discussing removal mentions that the areas beneath (downslope) of structures (the Gantry and Stevedore Building) will not be excavated, but simply armored with rock. The reasons for this conclusion are not explained or evaluated in this or subsequent sections, and must be discussed.*

The statement in Section 7.2 should have referenced only the Stevedore Building and has been corrected. Section 8.4 was expanded to explain that it is not practicable to shore the building or to remove/replace the building to excavate the relatively small quantity of soil present beneath the building. The rock armor beneath the building will stabilize the slope and will be designed/constructed to act as a cap to prevent direct contact and migration of soil.



**Section 8.3.** *This section describes the focused removal and capping option, where only soil at the upstream area of Area 3 (between the Gantry and the south rail access to the Outfitting Dock) will be excavated. The focused removal does not extend to the north of the Gantry. This is not discussed and seems arbitrary.*

The lateral extent of impacts is discussed at length in Section 3 and appendices and summarized in Section 3.6. Section 6 was expanded and a new Appendix G was added to discuss the practicable limit of hot spot removal based on a cost-benefit analysis. These discussions are now referenced in Section 8.3.

**Section 8.4.** *The removal discussion states that soil above the RAOs (applicable cleanup levels) will be excavated and disposed across Area 3. Project RAOs have not been defined or discussed in the FS Report.*

This section mistakenly referred to RAOs. Section 8.4 was revised to refer to source control objectives (as defined in Section 5.1).

**Section 10.1.** *This section and the resulting proposed remedy may need to be revised based on draft FS comments from both DEQ and EPA.*

Section 10.1 was revised. The proposed remedy is partial removal of hot spots combined with capping.

**Section 10.2.** *It is very likely that the proposed remedial work will require habitat mitigation in order to be permitted. This outcome should be evaluated and discussed, as it has potential implications on several of the remedial alternative balancing factors. Gunderson may not be able to be specific, but some discussion and cost assumptions could be included. While it may be difficult to estimate costs associated with mitigation, mitigation costs added to one or more of the remedial alternatives could substantially affect one or more balancing factors.*

The baseline conditions for the riverbank consist of average slopes of 1.35H:1V, mixed rock/debris armoring on the lower slope, and scattered invasive species on the upper slope providing little effective habitat. The completed remedy would create flatter slopes (overall, 1.5H:1V or flatter) and between 0.5 to 1.7 acres of riparian habitat with native grasses, shrubs, and trees. In some areas, slope angles within some vertical intervals may be modified to improve habitat. Given that the remedy would improve the overall habitat, it is not expected that the remedy itself would create the need for mitigation. In response to EPA Specific Comment 20, discussion of mitigation, including rationale for not including mitigation costs in the alternatives, was moved to Section 7.2. In addition, Sections 4.3 and 4.5 were expanded to discuss existing bank conditions and habitat considerations for finish bank slopes.

**Section 10.3.** *Gunderson concludes that the finished slopes will have factors of safety that "exceed industry standard factors of safety for long term stability". Aside from a very brief mention in Section 4.5 (see comment Section 2.7 and 4.5, above), there is no substantive discussion of factors of safety or slope stability to support these conclusions. Only one of the slope options (3: 1) includes any factor of safety discussion, and that is unsupported within the report. Further, there is no discussion of factors of safety used in developing the 1.5:1 or 1: 1 slope options.*

See response to General Comments above. Additionally, Section 10.3 presents prospective statements indicating what will be done during design and implementation. Additional studies will be required to design finished slopes. Section 10.3 was revised to clarify.

## **EPA Comments (CDM Smith)**

### **General Comments**

*1. EPA understands that source control measures evaluated under this FS addresses only contamination of the Willamette River via erosion of riverbank soil. It should be assured that the source control measure selected for riverbank erosion is compatible with source control measures for the storm water and groundwater and does not preclude options to address these pathways, if necessary.*

Comment noted. The riverbank source control measure will be compatible with groundwater and stormwater source control measures, if they are required.

*2. EPA expects that future project activities (i.e., riverbank remedial design, permitting, and other authorizations) will allow EPA to have further input on the design and implementation of the selected source control measure. Such reviews will include integration with any in-water remedial efforts at Portland Harbor Sediment Decision Unit (SDU) River Mile 9 West (RM9W) expected to occur adjacent to the Schnitzer ASD Yard Riverbank.*

Comment noted. Gunderson will continue to provide project plans and reports to DEQ and EPA for comment. As discussed in the introduction to the FS, the riverbank source control measures will be implemented in a manner that is compatible with the adjacent in-water remedy. Additionally, conceptual coordination of the source control measure options with the potential in-water remedies are shown on the figures in the FS, and the ability to coordinate remedies was factored into the alternative evaluation.

*3. The conceptual site model (CSM) presented in Section 4 of the FS should provide additional detail regarding sources of contamination, release mechanisms, and the nature and extent of contamination at the Schnitzer ASD Yard Riverbank. For example, although historical site activity is described in Section 2, there is no explanation of the source of contamination in site soil. Similarly, the FS describes a history of fill placement but there are no maps or cross sections showing the extent of the fill and its relation to contamination at the site. Cross sections showing the depth of the fill-alluvium contact, water table, and vertical extent of contamination should be included with the CSM.*

A detailed discussion of the historical activities that resulted in riverbank contamination, and a detailed description of filling activities were presented in Gunderson's response to EPA's CERCLA Section 104e information request. From that information it was concluded that riverbank contamination is the result of historical activities and there are no ongoing sources. The nature and extent of contamination at the Schnitzer ASD Yard riverbank has been described in reports previously prepared and submitted to EPA and DEQ (e.g., *Area 3 – Erodible and Riverbank Soil Source Control Evaluation* [Shaw Environmental Inc., 2011] and *Supplemental Schnitzer ASD Yard Riverbank Soil Source Control Evaluation and Focused Feasibility Study Work Plan* [Apex Companies, LLC, 2012]), and was further evaluated in Section 3 of the FS. The source control evaluation established that bank erosion/stability was a pathway requiring source control measures at the Schnitzer ASD Yard. The FS addresses riverbank soil only. Other potential pathways (e.g., stormwater, groundwater) are being addressed separately. Section 1.1 was expanded to clarify that the FS addresses riverbank soil only. Section 3 presents a detailed evaluation of the nature and extent of contamination. Section 4.2 summarizes the results, and a reference to Section 3 was added to Section 4.2.

*4. The FS should include a clear discussion of what the excavation depths will be for Alternatives 3 and 4 and how the depths will be determined. The FS states that the objectives of excavation in Alternatives 3 and 4 are to address hot spot soils related to upland direct contact exposure pathways (Alternative 3) and to remove soil that exceeds RAOs (Alternative 4) and the remediation cost estimates are based on excavation to a depth of 3 feet. Based on the characterization soil sample results presented in Appendix A, excavation to 3 feet would not meet these objectives in some locations; at many locations, COCs are present at concentrations exceeding the screening levels or hot spot levels at the deepest depth sampled. As a result of these findings, the total required excavation depth looks to be*

*unknown. The FS should resolve how the excavation depths for Alternatives 3 and 4 would be determined given these data gaps and remedial cost estimates should be refined accordingly.*

The excavation depths for Alternatives 3 and 4 are presented in Sections 8.3 and 8.4 and associated figures showing cross sections. Except where deeper to accommodate revisions to the slope steepness, excavations will be to a depth of 3 feet. That depth is sufficient to remove hot spots because: (1) the direct contact pathways for human occupational workers and ecological receptors applies only to the upper 3 feet of soil; (2) construction/excavation workers could be exposed to deeper soil, but there are no COCs above hot spot levels for these receptors in soil greater than 3 feet deep; (3) after bank stabilization, residual impacted soil would no longer be erodible, so the residual impacted soil could no longer meet hot spot criteria resulting from sediment impacts due to an absence of mobility. Section 4.2 was expanded to clarify that hot spots are present only to a depth of 3 feet once the bank is stabilized. Sections 8.3 and 8.4 were modified to clarify excavation depths. A cross section was added for Alternative 3 showing the proposed excavation.

*5. For a comparative evaluation of alternatives, the FS needs to include within one or more of the existing alternatives, a component specifically addressing the substantive provisions of applicable regulatory permits. Section 10.2 identifies that a Clean Water Act Section 404 Permit will be required but acknowledges that substantive provisions for mitigation requirements imposed by the permit were not included in the alternative scope or cost estimates. The Section 404 permit will trigger consultation for compliance with the Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation and Management Act [MSA], as identified in the list of adopted ARARS in Appendix G. This consultation process will consider 1) effects on ESA listed salmonid species and impacts to essential fish habitat and 2) the effects of the source control action including actions to mitigate the effects. Under ESA and MSA, the National Marine Fisheries Service (NMFS) has the responsibility for issuing the biological opinion for the action. EPA understands that for protecting essential fish habitat, NMFS has indicated a 5H: IV slope is "ideal." Because the proposed riverbank slopes in Alternatives 2, 3, and 4 do not meet this recommended slope, the FS should document how the proposed source control measure will minimize adverse impacts to essential fish habitat and aquatic resources. This may be achieved by proper sizing of the material (e.g., use of 3-inch minus rounded cobbles) and native plants to minimize erosion potential. In addition, the FS should describe any off-site mitigation that might be required and include consideration of the costs of any such mitigation in the remedial cost estimate for each alternative. Mitigation costs for Alternatives 2, 3, and 4 are expected to be significant and may affect the ranking of alternatives.*

See response to DEQ Specific Comment on Section 10.2.

*6. To provide and evaluate a range of alternatives that will allow ODEQ to select a remedial action, the FS should include another alternative that meets the remedial objectives and ESA, MSA, and NMFS requirements for restoration of essential fish habitat. The new alternative would provide a comparative evaluation between alternatives that will require off site mitigation (Alternatives 2, 3, and 4) and an alternative with riverbank construction designed to protect fish habitat (see General Comment #5). This alternative would include bank stabilization and capping designed to provide for the restoration of essential fish habitat. Bank stabilization and capping under this alternative would require cutting back the riverbank to a shallower slope than in Alternatives 2, 3, and 4, which would have the added benefit of more removal of contaminated soil at hotspots and other areas exceeding screening levels, enhancing the protectiveness of the alternative. This alternative should also consider cap construction materials that would minimize adverse impacts to aquatic and riparian habitat, such as use of 3-inch minus river rock and native plants to minimize erosion. Additional construction costs for this alternative relative to Alternatives 2 and 3 would be partially offset by the elimination of mitigation costs (see General Comment #5).*

This comment presupposes that implementation of riverbank source control measures will trigger restoration requirements under ESA, MSA, and NMFS, and that the costs for restoration will be sufficient to affect the rankings of Alternatives 2, 3, and 4. As discussed in the response to DEQ's Comment on Section 10.2 (as referenced in response to EPA Comment 5), the need and scope of restoration cannot be determined until: (1) the in-water remedy

is selected and a compatible riverbank source control measure is designed; and (2) a biological assessment has been completed.

Section 4.5 was expanded to discuss bank slopes evaluated for the FS. As discussed in Section 2.1 and an expanded Section 4.4 of the FS, the upland area adjacent to the riverbank is an operating industrial facility. The land in this area is needed for ongoing operations. Therefore, source control alternatives that result in the loss of significant upland area (e.g., a 5H:1V bank slope) are not compatible with the facility. As discussed in response to DEQ Specific Comment on Section 10.2, off-site mitigation is not expected to be required with the alternatives evaluated in the FS because the overall habitat will be improved with the proposed remedies.

*7. Within the Lower Willamette River, FEMA, the City of Portland Office of Planning and Development Review (OPDR), and Metro administer floodway management jointly. The City of Portland and Metro have adopted a balanced cut and fill regulation applicable to areas within the FEMA 100-year floodplain and the February 1996 flood inundation area to preserve the area's capacity for water flow and flood storage. The FS should describe the degree to which balanced cut and fill will be maintained for each alternative. Also, the 100-year floodplain should be indicated on the remedial alternative profile drawings.*

See response to DEQ General Comment on *Selected Remedy and Permitting*. The 100-year floodplain elevation was added to the cross sections on Figures 6 and 10. However, as previously stated, Superfund remedies and removals are only required to meet the substantive requirements of applicable or relevant and appropriate provisions of other state and federal laws (ARARs). This requirement does not apply to local laws, such as the City of Portland Development Code. Therefore, until the ROD is issued, it is unclear that balanced cut and fill is a requirement for remedy selection. Regardless, the current draft FS for the Portland Harbor shows that dredge volumes exceed fill volumes so the substantive requirements for flood concerns will be met. Section 4.6 has been expanded to discuss the in-water remedy in greater detail. Sections 8.2 through 8.4 were revised to include discussion of the balance of cuts and fills.

*8. ODEQ regulations call for a higher reasonableness of cost threshold for removal and off-site disposal (or treatment). For this reason, EPA believes that Alternative 3 (Focused Removal and Capping) should be the recommended alternative pending the evaluation of an additional alternative (i.e., bank stabilization and capping suitable for restoration of fish habitat).*

Alternative 3 is the recommended alternative in the revised FS.

## Specific Comments

*1. Section 1.3, Page 2, fourth paragraph - It is recommended that the balancing factor "longterm feasibility" be changed to long-term reliability.*

The text was modified as indicated.

*2. Section 2.4, Page 4 - It is recommended that additional information on groundwater and surface water elevations (i.e., how they vary seasonally and with tidal cycles) be presented in this section. Groundwater and surface water elevation and changes in elevation throughout the year are relevant to excavation and cap construction.*

Sections 2.4 and 2.5 were expanded with additional information on groundwater and surface water.

*3. Section 2.6, Page 4 - It is recommended that the area of soil data evaluated be expanded to match the maximum expected area of the source control measure and not be limited to within 100 feet of the top of the bank. For example, the recommended additional alternative to provide a riverbank stabilization and cap suitable for rehabilitation of and preserving essential fish habitat will likely require a shallower slope that will extend further*

*shoreward. Therefore, it will be necessary to characterize the soil to plan for handling and disposal of the soil removed during grading and cap construction.*

Soil data for the area within 100 feet of the riverbank are adequate for the remedial alternatives under consideration. Soil data for areas more than 100 feet from the river bank would be required only for an alternative consisting of an extremely low-angle bank slope. However, as discussed in the response to General Comment No. 6, an extremely low-angle bank is not compatible with facility operations. Additionally, even a slope at 5H:1V would extend back only approximately 90 feet from the current top of slope. Therefore, 100 feet is adequate regardless.

*4. Section 3.3, Page 9, first paragraph- It is recommended that the FS provide a summary of discussion of how constituents of interest (COIs) were selected. From the site description and historical site use it is not clear what the source of contamination is and how the list of COIs were selected. Rational for not including volatile organic compounds and pesticides in the list of COIs should also be presented in this section.*

COI were selected based on the upland investigations conducted in 2005 and 2011. The COI were identified and screened in the Supplemental Schnitzer ASD Yard Riverbank Soil Source Control Evaluation and Focused Feasibility Study Work Plan (Apex Companies, LLC, 2012). DEQ reviewed the report and commented in a letter dated October 10, 2012. In that letter, DEQ's only comment regarding COI was that tributyltin (TBT), should be identified as a constituent of potential concern (COPC) and additional dioxins/furans data are necessary to characterize riverbank soil.

*5. Section 3.7, Page 13, second paragraph-The statement that "only arsenic, lead, and benzo(a)pyrene were detected above construction or excavation worker SL Vs with the depth range of 3 to 15 feet" is not correct. Dioxans/furans (sic) may also be present at concentrations exceeded the SL Vs in this depth range but it is not know because no dioxin/furan results for samples collected deeper than 3 feet are presented in the FS. The lateral extent of dioxin/furans exceeding screening levels is also not defined because dioxan/furan (sic) results are presented for only a small group of samples that were collected east of the Gantry. It is recommended that this data gap for the vertical and lateral extent of dioxan/furans (sic) be described in the FS.*

It is understood that additional data collection may be needed for design. Section 3.7 was expanded to identify the data gap for soil at depth. Each of the alternatives includes a soil management plan to address soil remaining beneath caps or below the depth of excavation.

*6. Section 4.2, Page 14 - Please specify that metals and PCBs exceed hot spot levels for terrestrial ecological direct contact.*

Section 4.2 was revised to clarify that direct contact hot spots were for ecological receptors only.

*7. Section 4.3, Page 14, first paragraph- It is recommended that the "possible other materials" present in the core of the riverbank also be described.*

Section 4.3 was revised to indicate that debris similar to that observed in the riverbank face is present in the fill.

*8. Section 4.6, Page 15 -The draft Portland Harbor FS includes active remediation offshore of Area 3 under all remedial alternatives. As stated in the general comments above, it is recommended that all alternatives describe how offshore sediment remediation might be integrated into the proposed source control measure. Although EPA is currently revising the Portland Harbor FS, it is likely that remediation offshore of Area 3 will be proposed.*

See Response to DEQ General Comment on Remedies in relation to in-water work.

*9. Section 7.1, Page 18, first paragraph-Table 1 indicates that the on-site disposal technology was not retained; however, Alternatives 2, 3, and 4 describe the placement of contaminated soil removed during slope grading in a berm at the top of the slope. Any excavated soil that is to be reused or placed under the cap will require testing to determine if site COCs are not present above RCRA hazardous waste levels, particularly lead which has been demonstrated to be present exceeding TCLP criteria in the riverbank soil. Excavated soil containing COCs at concentrations above RCRA hazardous waste levels should be taken off-site for disposal; only soil that is suitable for disposal in a RCRA Subtitle D landfill and demonstrated not to pose a risk to the river should be considered for reuse in the bank construction. It is recommended that the FS describe how cut material from grading of the slope and other excavated soil will be profiled for reuse or off-site disposal.*

To clarify, Alternative 4 does not include re-grading of soil. For Alternatives 2 and 3, the use of the term "excavated" on the cross-sections may be misleading. These soils are not actually excavated but would be re-graded to create a stable slope (together with imported fill). This material is not generated and is therefore not a waste. Gunderson concurs that soil must be adequately characterized prior to off-site disposal. A preliminary waste disposal evaluation is included in Section 4.7 that was used in the FS evaluation. Soil profiling plans will be described in detail in a future source control design report.

*10. Section 8.1, Page 20, Protectiveness Evaluation - It is recommended that the FS state that Alternative 1 will not meet the source control objectives.*

Section 8.1 was revised accordingly.

*11. Section 8.2, Page 21, Option 1 bullet- Only clean fill, as defined in ODEQ's solid waste regulations, should be used for filling of excavations and cap construction. The terms "select fill", "imported fill", and "common fill" are used throughout the alternative descriptions and in figures. It is recommended that 1) these terms be defined in this section and 2) their use in different parts of the cap and excavation backfill be explained.*

Sections 8.2 through 8.4 and Figures 6, 7, and 10 were expanded to better describe the various materials proposed for fill.

*12. Section 8.2, Page 21, Option 2 bullet - As stated in previous comments, reuse of any soil removed in regrading the slope or in off-site disposal of excavated soil will require sampling for waste profiling. It is recommended that sampling and analysis costs associated with waste characterization be included in the cost estimates. There will also be sampling and analysis costs associated with confirmation of on-site lead stabilization treatment in Alternatives 2, 3, and 4, which have not been included in the cost estimates. Only clean fill can be used for construction of cap and backfilling of excavations.*

See Response to EPA Specific Comment 9. The costs for sampling and analysis of excavated soil for waste profiling are nominal so are included in the engineering oversight unit cost.

*13. Section 8.2, Page 22, second bullet -The placement of the demarcation fabric (shown in the drawings and listed in the construction material quantities) should be described for Alternatives 2, 3, and the additional alternative for construction of riverbank slope and cap suitable for restoration of or preserving essential fish habitat. It is recommended that the geotextile be placed below the cap materials, which in the future will help determine if overlying cap has been eroded to expose the underlying soil.*

Sections 8.2 and 8.3 were modified to indicate that a geotextile demarcation fabric would be placed between the cap material and underlying soil.

*14. Section 8.2, Page 22, second bullet - It is recommended that rationale be presented for extending the armored portion of the cap to only elevation 20 feet NAD88. Potential erosion from flood events and wind and vessel induced*

*waves should also be factored into the design to prevent erosion of the upper jute mat over topsoil cap. The evaluation of long-term reliability should also note that the cap will be designed to resist wind and vessel induced waves over a range of river elevations.*

Sections 8.2 through 8.3 were expanded to discuss where and why armoring/vegetation would be used to protect against the various erosive forces, and the long-term reliability discussions were expanded to discuss erosion protection.

*15. Section 8.2, Page 23, third paragraph- The statement that "the COCs have relatively low solubility so are immobile" is not accurate. As evidenced by the TCLP results for lead, the leaching of COCs from contaminated soil in the riverbank and transport via the groundwater pathway to the Willamette River is of concern and should be addressed in the groundwater source control evaluation for Area 3.*

The statement was not changed. Groundwater is being evaluated independently; this FS is addressing the potential for transport of solids to the river via erosion. The TCLP test is a method designed to simulate acidic conditions in a solid waste landfill. It does not represent the solubility of lead in situ at the Facility.

*16. Section 8.3, Page 24, first bullet. The description of Alternative 3 states that the minimum excavation depth would be 3 feet and Figure 8 indicates excavation depths ranging from 3 to 9 feet; however, the cost estimates are based on excavation to a depth of only 3 feet. The analytical results presented in Appendix A indicate that excavation to deeper than 3 feet may be required in some areas (many areas have vertical extent of hotspots undefined) to achieve the stated objective of addressing hot spots related to direct contact exposure pathways, so the basis for excavation to only 3 feet is not clear. It is recommended that a discussion of the basis for the assumed 3-foot excavation depth be provided in this section.*

To clarify, the cost estimates are based on excavation depths ranging up to 9 feet. See response to EPA General Comment 4.

*17. Section 8.4, Page 28, first paragraph- The term "RAO" is not defined in the FS. If RAO is meant to be the screening levels established in Section 3, then this should be stated; if RAO is a new term to be applied in Alternative 4, then it should be defined and its relation to source control objectives and screening levels should be explained. It is recommended that these issues be addressed.*

This section mistakenly referred to RAOs. Section 8.4 was revised to refer to source control objectives (as defined in Section 5.1).

*18. Section 8.4, Page 28, first bullet- The assumed excavation depth for Alternative 4 of 3 feet significantly underestimates the excavation depth needed to achieve the stated objective of removing soil exceeding the RBCs for occupational and ecological receptors, based on the data presented in Appendix A. It is recommended that the cost estimate for Alternative 4 be revised based on a more realistic assumed excavation volume.*

Consistent with the risk screening, occupational and terrestrial ecological receptors are assumed to be exposed only to soil within 3 feet of the ground surface. No changes were made.

*19. Section 10.1, Page 34, first bullet- The statement that "given the relatively high cost to remove the hot spots (greater than 50 percent increase in total cost), the marginal benefit for hot spot removal is not sufficient to warrant removal of the direct contact hot spots" is misleading. Based on a comparison of the total cost for the capping alternative and the focused removal and cap alternative, the cost to remove the hot spots only increases the cost by 26 percent, not the 50 percent stated in Section 10.1 [ $(\$2,200,000 + \$1,740,000) \times 100\% = 126\%$ ]. It is recommended that this discrepancy be addressed.*

The focused removal and cap alternative does not address all of the hot spots. The cost comparison is between the cap and removal alternatives. No change was made.

*20. Section 10.2, Page 34, first paragraph - The statement regarding omitting mitigation costs would be better placed early within the development of alternatives discussion; it is out of place in the section on permits. In addition, without the mitigation costs, the range of alternatives provided does not cover a range sufficient to evaluate and select an appropriate remedy. See General Comment 6 regarding the range of alternatives. It is recommended that these issues be addressed.*

Discussion of mitigation, including rationale for not including mitigation costs in the alternatives, was moved to Section 7.2.

*21. Section 10.3, Page 34, second paragraph- The residual risk assessment in Section 10.3 does not meet the requirement under OAR-340-122-0084(4)b that qualitative or quantitative assessment of the adequacy and reliability of any institutional or engineering controls to be used for management of treatment residuals and untreated hazardous substances remaining at the facility. It is recommended that the residual risk assessment be updated with this assessment to demonstrate that acceptable levels of risk as defined by OAR 340-122-0115 would be attained.*

Section 10.3 was expanded to clarify the adequacy and reliability of the engineering and institutional controls proposed.

*22. Section 10.3, Page 34, third paragraph- The testing of imported fill should include analysis for any contaminant potentially present in the fill, not just testing for COCs from the Area 3. It is recommended that this requirement be added.*

Section 10.3 was revised to reference potential contaminants rather than COCs.

### **Five Tribes Comments (Hydro Analysis)**

No substantive comments were provided. Editorial changes were made in Sections 1.1, 2.1, 3.2, and 4.4 in response to these comments.